

REMARKS

In this response, Claims 1, 5, and 8 have been amended. Claims 9-28 have been withdrawn in response to a restriction requirement. Claim 2 is original. Claims 3, 4, 6, and 7 have been previously presented. New Claims 29-31 have been added. Accordingly, Claims 1-8 and 29-31 remain pending in the application.

Objections

The specification was objected to as failing to provide proper antecedent basis for the claimed subject matter. Specifically, in Claim 5, the term "Malathion, 2,4,-D" is used, even though absent from the specification.

Claim 8 was objected to because of typographical error. In the second line of the claim, "arc" was used instead of are.

In response to these objections, Claims 5 and 8 have been amended to correct these informalities.

The Examiner also objected to Claim 8, stating that the particular order of steps required is not found in the specification. Applicant respectfully disagrees.

The particular order of steps required in Claim 8 is found in the specification. The specification describes the method when using the apparatus of Fig. 1, wherein the ozone is introduced into the auger tube as described at [0023]:

"The invention further comprises an ozone source 15, connected to the tube in proximity of the intake, such that ozone is directly injected into the tube at the beginning of the treatment process so that the seeds are subjected to microwaves and ozone simultaneously."

At paragraph [0030] the specification then goes on to state:

"Alternatively, instead of or in addition to, introducing ozone into the tube of the auger conveyor 7, the seeds may be discharged from the auger conveyor 7 into a separate container such as the conventional storage silo 19, as illustrated in FIG. 2."

The Applicant respectfully submits that the alternate method described in [0030] sets out the order of Claim 8, and therefore respectfully requests that this objection be withdrawn.

Rejections under 35 U.S.C. § 112

Claim 1 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Specifically, the terms "significantly" and "substantially" are relative terms which render the claim indefinite. The Examiner contends that "significantly" is not defined by the claim,

nor provided in the specification, nor reasonably apprised of the scope of the invention by one skilled in the art.

Claim 1 has been amended to correct the indefinite rejections.

Rejections under 35 U.S.C. § 103(a)

Claims 1-8 stand rejected under 35 U.S.C. § 103 (a) as being unpatentable over Childress (USPN 5,919,390) in view of Denvir (USPN 6,171,625). Specifically, the Office Action states that Childress provides a method for roasting raw seeds or nuts by placing nuts or seeds in a microwave oven in a package and cooking (subjecting to microwaves), which then produces steam in the package from the moisture in the seeds. Childress does not teach subjecting the seed sample to ozone. However, Denvir does teach a process of decontaminating agricultural products with ozone.

The present invention provides a method of treating a seed sample comprising: subjecting the seed sample to a combination of steam and microwaves operative to heat the seed sample to a treatment temperature effective to inactivate seeds in the seed sample to prevent germination and reproduction of the seeds; and subjecting the seed sample to an effective ozone concentration operative to degrade herbicides and pesticides present in the seed sample and operative to inactivate all pathogenic organisms present in the seed sample.

The Examiner states that one of ordinary skill in the art would have been motivated to modify Childress in view of Denvir in order to produce a food product containing fewer toxins or

in order to prevent the food product from spoiling.

In response the Applicant has amended Claim 1 to specify that the method of the invention is for treating a seed sample to prevent germination of the seeds in the sample, and to render the seeds in the seed sample safe for disposal. In contrast the processes of Childress and Denvir must be concerned with avoiding damage to the seeds being treated, and in the process of Childress, actually enhancing the product being treated.

The Childress process is a variation on microwave pop corn, and is directed to microwaving in-shell nuts, such as peanuts, by a process which produces a roasted product with certain desirable characteristics of texture and crunchiness. Childress states at column 1, lines 48-51:

"Microwave roasting in-shell nuts and seeds presents a unique challenge because the microwave heat must be utilized precisely to achieve the desired texture and crunchiness of the roasted product."

Denvir's process provides a system for the decontamination of agricultural product by use of ozone in the scavenging of microorganisms infecting the product and/or the oxidation of toxins present in the product, but also without damaging the product being treated. Denvir states at column 8, lines 58-67:

"The invention allows for safer ozone treatment by providing one or more ozone destruction units that may be placed in the treatment chamber at one or more gas

exit ports. Ozone destruction units may destroy any ozone that is being evacuated to the atmosphere. The invention also provides pressure sensors that may be placed within the treatment chamber to prevent pressure build-up by controlling the supply of ozone to the treatment chamber, thus reducing the risk of damage to the treated product and/or the treatment equipment.”

Thus both Childress and Denvir are directed to processes on products where the product must not be damaged in the process.

In contrast in the process of the present Claim 1 the steps are not concerned with avoiding damage to the seed sample being treated. The steps are:

“subjecting the seed sample to a combination of steam and microwaves operative to heat the seed sample to a treatment temperature.....; and subjecting the seed sample to an effective ozone concentration operative to....”

No upper limit is placed on temperature or ozone concentration that could damage seeds. Any such damage is irrelevant since the treated seed is to be disposed of. Childress and Denvir thus teach away from the present invention, since they teach that care must be taken to avoid damage to the product subjected to the process.

The Examiner also mentions USPN 5,703,009 to Yvin which discloses a method for improving the germination of seeds or the growth of bulbs in which, prior to planting, the seeds or bulbs are placed into contact with gaseous ozone. Again this prior art teaches away from the present invention, which is directed to destroying germination.

Further Childress is taking well known microwave packaging and cooking technology and is adapting same to a particular food product. The Applicant respectfully submits that Childress is in fact not "treating raw seeds" with microwaves and steam as stated by the Examiner, but is "cooking" in-shell nuts.

The Applicant therefore respectfully submits that there would be no motivation to modify Childress in view of Denvir in order to produce a food product containing fewer toxins or in order to prevent the food product from spoiling. The in-shell nuts being cooked by Childress would not be "toxic" as same have already been packaged for food use by a consumer, and as such must be free of toxins before being cooked in the microwave. Childress is likewise not concerned with spoilage, since his process is directed to cooking a food product which is to be consumed when cooked.

Further the Applicant respectfully submits that neither Childress nor Denvir teach the present problem, or it's source - destroying germination and sterilization of agricultural seeds, such as genetically modified seeds.

Further the Applicant respectfully submits that adding ozone to the process of Childress would destroy the functionality of the Childress process - ozone is a poisonous gas, which could

not be used in a consumer microwave. If ozone were added to the "bag" claimed by Childress, the bag could not safely be placed in a microwave oven as taught by the specification, and as claimed by Childress.

The Applicant claims a combination of exposure to steam, which moistens and heats the seeds and microwaves. As stated in the present application at paragraph [0011], the ozone works in combination with the steam and microwaves to degrade residual chemicals, and to deactivate the seeds and any associated pathogens present in the seed sample.

Denvir speaks to the effect of heat and moisture on the activity of ozone at column 3, lines 50 - 60:

"Ozone's high reactivity introduces numerous problems. For example, ozone decomposition is easily accelerated by water, nearly all types of organic chemicals, and many types of inorganic chemicals. Ozone is also a surface active material, i.e. ozone decomposition is accelerated when ozone comes in contact with a surface, especially if the surface is organic in nature. Furthermore, ozone decomposition is accelerated at higher temperatures and pressures, by turbulence, ultrasound and ultraviolet light. Thus, unlike most conventional gases, ozone is not suitable for storage for more than a short period of time."

Thus it is clear that the reactivity of ozone, and its ability to degrade herbicides and pesticides and oxidize pathogens, is enhanced by the use of steam and microwaves. In the

process of Denvir, this 'enhancement' is seen as problematic rather than beneficial, such that Denvir again in this manner teaches away from the present invention.

Claims 2-8 depend either directly or indirectly from amended Claim 1, and include all of the limitations of Claim 1, and thus are allowable for at least these same reasons.

The Applicant has also added new Claims 29-31. Claim 29 adds the step of passing the seeds through a shredder roller to break open the seeds before subjecting the seed sample to the combination of steam and microwaves, as described in the specification at paragraph [0019]. The Applicant respectfully submits that this step is not disclosed or suggested in the prior art. The Applicant further submits that Childress and Denvir both teach away from damaging the product being treated.

Claim 30 adds the limitation that the seeds being treated are genetically modified, as discussed in the specification at paragraphs [0002] and [0004]. Claim 31 adds the further step of composting the treated seed as described at paragraph [0027]. The Applicant respectfully submits that neither limitation is suggested by the prior art.

Based on the above amendments and remarks, Applicant believes that the application is now in condition for allowance.

The Director is hereby authorized to charge any fees or any underpayments which may be required for the above-referenced application to Deposit Account No. 01-0265. Any overpayments should be refunded to Deposit Account No. 01-0265.

Respectfully submitted,

/ W. Thad Adams, III /

W. Thad Adams, III
Attorney for Applicant
Reg. No. 29,037

ADAMS INTELLECTUAL PROPERTY LAW, P.A.
Suite 2350, Charlotte Plaza
201 South College Street
Charlotte, NC 28244
Tel: (704) 375-9249
Fax: (704) 375-0729
Email: wta@adamspat.com